

The Marine Corps Needs a Targeting, Sensors, and Surveillance Systems Operational Integration
and Support Team

Captain D.M. Darnell

Major A.B. Irvin, CG 7

2 March 2010

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 02 MAR 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE The Marine Corps Needs a Targeting, Sensors, and Surveillance Systems Operational Integration and Support Team				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Marine Corps, , ,				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 13	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

A Marine sergeant is leading a four-vehicle patrol down a main supply route (MSR) in Iraq when it is attacked with an improvised explosive device (IED). No one is hurt, though a vehicle sustains minor damage. The triggerman is probably still close; lately all IEDs in the area have been initiated via command-wire. The squad leader sets a cordon, ensures an IED 9-Line is sent to the company headquarters, and waits for an Explosive Ordnance Disposal (EOD) team to arrive. With only fourteen Marines to secure the area, the squad leader cannot go too far in search of the triggerman. Meanwhile, the company quickly relays the report to the watch officer in the battalion Combat Operations Center (COC). The air officer and S-2 in the battalion COC immediately collaborate to source overhead surveillance while the watch officer ensures EOD is notified. A Marine Shadow Unmanned Aerial System (UAS) is currently conducting surveillance in another part of the battalion's area of operations (AO). The intelligence analyst, who is monitoring the Shadow's progress along a pre-assigned target deck via Microsoft Internet Relay Chat (mIRC), directs the UAS to the location of the IED attack. The Shadow will be overhead in less than ten minutes.

Once overhead, the Shadow scans the surrounding area and spots a single individual oddly positioned along the bank of a canal about 300 meters north of the IED blast. The Multi-Directional Antenna System (MDAS) and One System Remote Video Terminal (OSRVT) allow for a good full motion video feed of the infrared (IR) sensor onboard the UAS. The intelligence analyst notifies the watch officer of the sighting. The watch officer tells the radio watch to relay the details to the company so they can inform the squad leader at the scene. This information could take a while to communicate verbally over different radio channels and may be confusing to the squad leader based on his perspective of the surrounding terrain. The clock is ticking as the suspected triggerman starts to move. Seeing the opportunity to catch him slipping away, the

air officer tells the watch officer to have the squad leader contact the Shadow operator via the radio retransmission frequency and have the Shadow's IR pointer provide terminal guidance to the suspect. Within minutes the squad leader is talking directly to the Shadow operator who "sparkles"¹ the individual hiding along the canal and provides updates of what he sees from above. The individual is apprehended because the full capabilities of the Shadow are employed.

This true scenario could have ended with the triggerman escaping if the Shadow operator was not communicating directly with the squad leader and providing terminal guidance. The intelligence analyst did not understand how to employ some of the Shadow UAS' operational capabilities, specifically its radio retransmission package and IR pointer. To him the UAS was nothing more than a flying camera. A general lack of understanding of many collections assets' capabilities along with other related targeting, sensor, and surveillance systems is a trend. The previous battalion's intelligence section did not even attempt to set up the MDAS and OSRVT systems that ultimately proved key in increasing this battalion's situational awareness dozens of times. The relieving air officer, after researching the equipment, explained to his battalion's intelligence section that the equipment was worth setting up and learning how to use because of its capabilities.² (The intelligence section managed the employment of all collections assets, including UAS and manned theater-level intelligence, surveillance, and reconnaissance (ISR) platforms.) Still, the intelligence section was resistant because it was unfamiliar with the gear, choosing to rely solely on the Remote Operated Video Enhance Receiver (ROVER) that was already in place. Ultimately, the air officer and his radio operator read the MDAS and OSRVT

¹ "Sparkle: Mark/mark target by IR pointer." MCRP 3-16.A, JFIRE, 20 December 2007, 81.

² The highly sensitive directional antenna of the MDAS significantly increases the receive range of the video downlink over that of the omni-directional ROVER antenna. The OSRVT provides Shadow telemetry data (UAS and sensor target location information) not available via the ROVER system. Using the ROVER instead of the OSRVT, the intelligence analysts would constantly ask the Shadow operator via mIRC where the Shadow sensor was looking. Of note, Scan Eagle telemetry data is not available even with the OSRVT, while all advanced targeting pods, theater level UAS, and most manned ISR platforms with full motion video broadcast telemetry data embedded in the video.

manuals, set up the systems, and trained the intelligence section on how to use their equipment that was purchased by the Department of Defense for over \$300,000.

This example highlights a problem not isolated to just battalion intelligence sections in Iraq, but one that continues to be voiced by units returning from Afghanistan.³ A general lack of familiarity with the capabilities, limitations, and concepts of employment of many of the targeting, sensor, and surveillance systems recently fielded is primarily due to the rapid influx of new systems, the methods in which they are fielded, and the lack of training on those systems. As advances in technology will continue to be used in an attempt to address some of the challenges and troop-to-task limitations brought on by the complexities of counter-insurgency (COIN) operations, this problem will persist. Military occupational specialty (MOS) producing schools cannot keep up with these changes and Mohave Viper is too late in the unit pre-deployment training cycle to introduce new technology and concepts of employment to deploying units. Therefore, the Marine Corps needs a targeting, sensors, and surveillance operational integration and support team designed and tasked to inform and educate the operating forces on the fielding plans, theater availability, concepts of employment, and integration potential of those systems early in the pre-deployment training cycle in order to maximize their effective employment in combat.

Fielding of New Equipment

The Marine Corps fields gear to operational units at their home stations and while forward deployed. While hundreds of millions of dollars are spent each year on new equipment to save lives and hunt insurgents, the effort to ensure Marines understand how to integrate all of

³ Maj Matthew C. Hawkins, USMC, Operations Officer, 3rd Battalion, 10th Marines, "MAGTF Fires TECOE," 30 December 2009, personal e-mail (3 January 2010).

these new capabilities is neglected. Often, units learn about or receive new systems or equipment weeks before they deploy. Frequently they are introduced to new gear once in theater. It is too often up to those who receive the equipment to figure out for themselves what the unfamiliar technologies can do to support the unit's mission. Nevertheless, some gear sits unused because no one has the time to figure out what is in the big plastic cases. Even worse, the new gear is adapted without proper safety considerations, as in the case of the Ground-Based Operational Surveillance System (G-BOSS) with a Class IIIb laser pointer. This class of laser requires users to receive a laser safety class because of the physical damage it can cause. But the training is rarely received due to ignorance of the requirement or logistical constraints once in theater. Knowledge of the requirement prior to deployment would allow for the training to be accomplished though.

Strengths and Weaknesses of Various Fielding Methods

The traditional method of acquiring new gear is the slow but deliberate program of record acquisition process. Through circumstances brought on by Operation ENDURING FREEDOM (OEF) and Operation IRAQI FREEDOM (OIF), equipment has been fielded through more expedient methods. Some of those methods are: Urgent Universal Needs Statements (UUNS), special projects from Joint IED Defeat Organization (JIEDDO) or Marine Corps Warfighting Laboratory (MCWL), open-purchasing of Commercial Off-The-Shelf (COTS) technologies, Theater Provided Equipment (TPE), and others. Each fielding method has its particular strengths and weaknesses, some of which are touched upon below.

- Programs of record go through a deliberate process to ensure the gear meets strict criteria and has a long-term fielding, training, and maintenance plan for the life-cycle of the

equipment. The initial training is usually conducted during fielding, then eventually transitioned to MOS schools. But this fielding process often takes several years.

- Gear acquired via the UUNS process allows for rapid fielding of new technologies to forward units to meet a critical need. Conversely, it often does not provide for initial training and long-term maintenance, or any sets for pre-deployment training.
- JIEDDO, as a broad DOD initiative, has funded many key force protection initiatives in response to the number of service members killed by IEDs. But often there is a failure to coordinate properly across services while developing solutions.⁴
- TPE frequently fills the gaps in the unit table of equipment when it comes to computing, life support, and force protection equipment. But the equipment is often unfamiliar to the receiving unit and is provided without training or clear support and maintenance plans.

The multitude of ways in which new equipment is fielded to the operating forces makes it difficult to track what is coming, when it is coming, and why. Often, a previous unit or higher command element initiated the acquisition process and the background information is neglected in the battlefield handover. Furthermore, subordinate units rarely know to ask higher for newly arrived gear since they had no information on its availability or intended purpose.

Recently Fielded Targeting, Sensor, and Surveillance Equipment

Since the beginning of OEF, the Marine Corps has fielded a tremendous amount of new equipment relating to targeting, sensors, and surveillance systems. The list of new equipment

⁴ Two JIEDDO initiatives that were not well coordinate across services: (1) Counter Radio-Controlled IED Electronic Warfare (CREW) systems. The active jamming systems purchased for the Marine Corps conflicted with the reactive systems purchased for the Army. (2) The Keyhole kit of surveillance equipment. Designed to provide “snipers with an increased capability to visually detect the enemy emplacing IEDs,” (JIEDDO, *Annual Report FY 2008*, 9), it provided redundant capabilities already at the Marine infantry battalion level and arrived without any training or concept of employment.

fielded to infantry battalions in the last few years is quite impressive.⁵ Dozens of new or improved kinetic and non-kinetic fires are also in support of Marine forces as well. Improved seismic sensors as well as other new video and motion surveillance technologies are being fielded to intelligence battalions but being pushed down to the infantry company level due to current operational requirements.⁶ Marine F/A-18s, AV-8Bs, and EA-6Bs have been outfitted with the LITENING II advanced targeting pod while the Scan Eagle (Tier II) and Shadow (Tier III) replaced the Pioneer UAS. The Marine C-130J is being tested with the Harvest Hawk sensor and 30mm gun system so it can provide precision fires in addition to its assault support mission.⁷ Air Force and coalition attack aircraft have capabilities have evolved while several Air Force and Navy platforms have been developed or modified to provide overhead surveillance across the electromagnetic, electro-optical, and IR spectrums. Airborne coalition, joint, theater, and national assets have also introduced dozens of new ISR capabilities used or accessed frequently by Marines on the ground. Nevertheless, Marine forces have had a difficult time keeping track of what is available and how to employ those assets efficiently and effectively. A Marine infantry battalion simply does not have the resources to track all of these changes in order to incorporate them into its long-range training plan. Receiving a crash course once in theater should be avoided if at all possible.

Responsibility for Training

⁵ Some of the newer equipment fielded to infantry battalions: Vector-21B Common Laser Range Finder (CLRF), Long Range Thermal Imager, Tactical Range Thermal Imager, Portable Lightweight Designator Rangefinder, Thermal Laser Spot Imager, Target Location Designation Handoff System (TLDHS)/Strikelink, Precision Strike Suite for Special Operations Forces (PSS-SOF), ROVER, OSRVT, VideoScout, G-BOSS, Raven B UAS (Tier I), Wasp Micro Air Vehicle (MAV) UAS (Tier I). This list is not all-inclusive; the list will grow again in 2010-11.

⁶ Gregory Seroka, PMP Project Lead, Program Manager Intel, MarCorSysCom. Integrated Team Solutions Facility, MTCSC, Stafford, VA, 9 December 2009. Discussion.

⁷ Trimble, Stephen. "US Marine Corps plans to convert KC-130J tankers into gunships," *Flight International*, 4 February 2009.

Responsibility to track all of these changes and inform deploying units about what to expect and how to focus its theater-specific preparations needs to be assigned since a gap clearly remains. For programs of record initial training occurs when the gear is issued to units as well as refresher training built into the contracts. The degree to which that happens and the success of that training is varies.⁸ MOS schools are also tasked with providing training. But as new equipment is fielded, the period of instruction cannot be adjusted to fit in that training so the equipment is merely introduced. Furthermore, schools are often the last to receive the gear since the fielding priority goes to operational units and gear fielded through UUNS rarely provides for training sets.⁹ The normal channels and methods for pushing information to operational units have not been able to keep up with the pace of change and provide accurate and relevant training guidance. The responsibility to train ultimately lies with the unit, but units should be provided more information in order to do so effectively.

Training and Education Center of Excellence (TECOE) Concept

Starting in 2004, the Joint Chiefs of Staff recommended Joint Centers of Excellence (COE) as well as service COEs for specific disciplines or warfighting functions. Consequently the Marine Corps Training and Education Command (TECOM) chartered fourteen different TECOEs, including a Fires TECOE. Several Fires and Command Element Operational Advisory Groups recommended and approved a MAGTF Fires COE, though it never gained traction.¹⁰ In 2009 TECOM disestablished all TECOEs except the Command and Control (C2) and

⁸ Joel Snively, Program Analyst/Fielding and Training, Program Manager Fire Support Systems, 18 December 2009, Interview.

⁹ Blue Force Tracker or Biometric Automated Toolset systems were not available in adequate numbers to incorporate into regular pre-deployment field training exercises at Camp Lejeune until 2009. Mohave Viper was often the first chance many Marines had to use the equipment. Following Mohave Viper, many units have limited Block V training time before conducting pre-deployment leave and embarking to theater.

¹⁰ Matthew C. Hawkins, "MAGTF Fires," *Marine Corps Gazette*, February 2008.

Intelligence TECOEs.¹¹ Though the proposed MAGTF Fires TECOE concept would have helped address some of the current deficiencies, the manpower requirements of around thirty company and field grade officers remained prohibitive.¹² The current operational tempo that led to these noted deficiencies has also been a barrier to a solution. As the manning requirements for individual augmentation billets, training teams, and forward command elements have created a tremendous burden on the force, many staff or command billets of units not deployed remain unfilled. The manpower limitation that precluded a MAGTF Fires TECOE is real, but an alternative solution requiring much less manpower can and should fill the gap.

A Solution That Works

Since a MAGTF Fires TECOE will not come to fruition anytime soon, a scaled-down solution needs to be implemented in its place. One example of a streamlined solution that already exists within the Marine Corps is the three-man Marine Expeditionary Unit (MEU) Support Team (MST) under Program Manager Intel. Consisting of one east coast MEU representative, one west coast MEU representative, and one technology representative, each MEU intelligence section has support from the time it is formed, throughout its workup, deployment, and even during after the after action write-ups. The representatives frequently embark with the MEU during work ups and travel with the MEU to and from theater, providing knowledge, experience, and wisdom. Instead of each MEU intelligence section starting from scratch, best practices are shared, built upon, and past mistakes not repeated. While the MST focuses primarily on supporting current MEU intelligence systems, the MST representatives also coordinate with

¹¹ Wesley Feight, LtCol USMC, Operations Officer, C2 TECOE, "C2 TECOE Charter Date, etc." 17 December 2009, personal e-mail (17 December 2009).

¹² Hawkins, Matthew C. Maj USMC, Operations Officer, 3rd Battalion, 10th Marines. "MAGTF Fires TECOE." 30 December 2009. Personal e-mail (3 January 2010).

outside agencies, attend fora/conferences, ensure intelligence systems remain compatible with future ships, and help the MEU efficiently meet its intelligence requirements.¹³

The proposed targeting, sensors, and surveillance operational integration and support team needs to be similar to the MST in its ability meet with units slated to deploy early in the pre-deployment work up cycle and during the after action process following deployment. This would provide the most impact by allowing for the infantry battalion or regiment to make the appropriate considerations in their long-range and mid-range training plans and for the team to update and refine the information it is providing. The team should consist of field grade officer team leader from the infantry, five experienced company grade officers from the infantry, artillery, fixed-wing, rotary-wing, and intelligence communities (with a minimum of one combat-experienced forward air controller), one infantry platoon sergeant operations chief, and one administration clerk to coordinate travel and information management. The eight-man team will need a travel budget that allows them to meet face-to-face with outside agencies as well as support all infantry battalions and regiments slated to deploy by providing insights into the latest and most relevant targeting, sensors, and surveillance systems. It is also essential the team travel with Marine Aviation Weapons and Tactics Squadron One and Tactical Training Exercise Control Group to visit forward deployed units to ensure the incorporation of the most current tactics, techniques, and procedures for employing those systems.

The team will not train units on specific systems, but will help units evaluate their training requirements based on what they will experience in theater. It will work with the Marine Expeditionary Forces and Divisions to develop an understanding of what resources are available for training at the unit level and advise units how they can access training resources not available

¹³ Seroka, Gregory. Project Lead, Program Manager Intel, MarCorSysCom. Integrated Team Solutions Facility, MTCSC, Stafford, VA, 9 December 2009. Discussion.

are their home stations. The team will continually adapt its training package based on evolving technology, missions, and threats. The ultimate goal of the team will be to advise deploying units on what systems are currently available, what systems will soon be fielded, what training and informational resources are available, and provide an overview of logical concepts of employment and integration based on the predicted threats and environment in which the unit will be operating. With dedicated support and guidance early in the pre-deployment training cycle, units will be better prepared when they step off the plane. Units will then be more likely to employ all of the latest systems to their fullest capabilities, systems which the tax payers have purchased at great expense in order to improve the chance of mission success and save lives.

Bibliography

Air Land Sea Application Center. *MCRP 3-16.A, JFIRE: Multi-Service Tactics, Techniques, and Procedures for the Application of Firepower*. 20 December 2007.

Alles, Randolph D., BGen USMC. 19 April 2007. *Testimony to House Armed Services Committee subcommittee on Air and Land Forces on Intelligence, Surveillance, and Reconnaissance (ISR) Programs*. <http://www.globalsecurity.org/intell/library/congress/2007_hr/070419-alles.pdf> (12 November 2009).

Brown, Chris L. Targeting Acquisition Team, Program Manager Fire Support Systems, MarCorSysCom. 15 December 2009. Phone discussion.

Eby, Jeffrey L., CWO5, Marine Gunner, Infantry Advocate Section, PP&O, HQMC. 13 November 2009. Discussion.

Feight, Wesley, LtCol USMC. Operations Officer, C2 TECOE. "C2 TECOE Charter Date, etc." 17 December 2009, personal e-mail (17 December 2009).

Hawkins, Matthew C. "MAGTF Fires." *Marine Corps Gazette*. February 2008, 43-46.

Hawkins, Matthew C. Maj USMC, Operations Officer, 3rd Battalion, 10th Marines. "MAGTF Fires TECOE." 30 December 2009. Personal e-mail (3 January 2010).

Joint Improvised Explosive Device Defeat Organizati (JIEDDO). *Annual Report FY 2008*. <<http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA502251&Location=U2&doc=GetTRDoc.pdf>> (12 November 2009).

Leaman, Bruce. Targeting Systems Project Officer, MarCorSysCom. 4 December 2009. Phone discussion.

Message, DTG R 191513Z APR 06, *Command Element Advocate Board Issues Summary and Status*, <https://www.mccdc.usmc.mil/OpsDiv/CEAB/06%20CEAB/Briefs/00-06-04-19_CEAB_Issues_and_Status_Msg.txt> (12 December 2009).

Pincus, Walter. "The Air Force to Train More Pilots for UAV, Than Fighter or Bomber Aircraft" 11 August 2009. <<http://www.aviationservicesdirectory.com/permalink.php?id=186>> (2 December 2009).

Seroka, Gregory. PMP Project Lead, Program Manager Intel, MarCorSysCom. Integrated Team Solutions Facility, MTCSC, Stafford, VA, 9 December 2009. Discussion.

Snively, Joel. Program Analyst/Fielding and Training, Program Manager Fire Support Systems. 18 December 2009, Interview.

Spiese, Melvin G., BGen USMC. *Command and Control (C2) Training and Education Center of Excellence (TECOE) Charter. Undated.* <<https://www.intranet.tecom.usmc.mil/sites/c2tecoe/default.aspx>> (2 December 2009).

Trimble, Stephen. "US Marine Corps plans to convert KC-130J tankers into gunships," *Flight International*. 4 February 2009. <<http://www.flightglobal.com/articles/2009/04/02/324708/us-marine-corps-plans-to-convert-kc-130j-tankers-into.html>> (2 December 2009).

MAGTF Fires Operational Advisory Group Brief to Comment Element Advisory Group. 30 June 2005. PowerPoint. <<https://192.156.75.123/OpsDiv/CEAB/Jun%202005%20CEAB/JUN%202005%20Briefs/06a%20%20MAGTF%20Fires%20OAG%20BRIEF%20CEAB%2030%20JUNE%2020052.ppt#4>> (2 December 2009)